Several tables summarize the results of the physical and mental measurements and examinations; but while these have a certain statistical value, they are certainly less important and illuminating than are the individual case studies with their tentative prognoses and recommendations.

The author believes that the high-grade feeble-minded fall into some ten groups: viz., the dull; the unstable; the dull unstable (exhibiting now dullness, now flighty, excited reactions); the neurasthenically unstable (showing marked self-consciousness, dissatisfaction with their own performance, general irritation and discontent); the hysterically unstable; the epileptic; those showing "characteristic tendencies to insanity" ("marked incoherence of response and action, with little appreciation of the seriousness of their errors"); the morally unstable; those who show general mental deterioration due to meningitis, etc.; and finally the "relatively defective." This last group includes those with comparatively good mental endowment, who show mental weakness due to poor health, poor eyes, or poor environment. Huey maintains that neuroses are the "next higher rungs in the ladder of retardation."

A syllabus for clinical examinations of defectives is appended giving detailed requirements for (1) Home Record, (2) Teacher's or Attendant's Record, (3) Physical Examination, (4) Mental Examination. The first three are valuable, as representing a much more thoroughgoing investigation than is usually made. The last is merely a brief digest of Goddard's revision of the Binet scale.

The book ends with a statement of the mental functions which Huey believes should be tested. These have to do chiefly, in his opinion, with feelings and instincts, especially those centering around consciousness of self, with the "master function of sex always prominent."

The author believes that clinical psychology has yet to discover what mental functions are entailed in various forms of arrest, as well as to formulate tests of their efficiency. He tentatively offers the following list as comprising the most important of these: the function of completed action, in *rapport* with the environment; of attention; of synthesis,; of feeling; of learning, memory and ability to make report; of reasoning; of forming ideas and judging values; of self-direction; of normal associations; of fatigue and recuperation; and, most important of all, the function of maintaining a normal level of psychic tension.

Huey's classifications seem to the present reviewer to be of problematic value; his list of unsolved problems suggests an excellent program for future investigators. Undoubtedly the most valuable contribution made by the author is his careful and detailed description of the clinical findings obtained in the examination of his cases.

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Inductive versus Deductive Methods of Teaching: An Experimental Research. By W. H. WINCH. Educational Psychology Monographs 11, Baltimore, Warwick and York, 1913. 146 p.

In this little volume Winch presents the results of an extended series of schoolroom experiments, directed toward a pedagogical problem of decided inport, by a man seasoned in the theory and practice of teaching. The author aimed to determine what are the

relative merits of inductive and deductive methods of instruction; and he measured the advantages of the two methods by the amount of the newly acquired material which the pupils (8 to 15 years) could reproduce immediately and at subsequent periods; and also by the capacity which they showed for making a successful attack upon other material of an analogous sort.

The author's experimental construction of the inductive method consisted *1* in presenting homogeneous groups of drawings of geometrical figures—squares, or triangles, and the like—each group properly labelled and containing members of different sizes, orientations, and when possible, shapes; and *2* in obtaining original definitions, evolved by the pupils from these groups of sensory materials. By drawing upon the blackboard literal representations of the pupils' statements he led them to detect their mistakes, without giving them any positive information. His deductive method consisted in having the pupils learn simply worded definitions of these same geometrical figures, with concomitant reference to drawings of the figures themselves. Winch divided his subjects into two groups of approximately equal ability, upon the basis of preliminary tests in which the pupils were shown a group of figures belonging to a single class and were asked to define from these the group name, with or without the negative guidance mentioned. One group was then instructed in inductive fashion, while the other group learned the definitions deductively. The groups were then reunited and asked to define the names of the geometrical forms which they had learned. At intervals of a week, a month, or two months, Winch again obtained definitions of the same terms, thereby testing the pupils' retention of the material which they had learned by one method or another; and in the meantime—at intervals of two or three weeks after the learning—he presented properly labelled groups of unfamiliar geometrical figures of analogous sort, which the pupils then defined. In this way he obtained a clue as to the pupils' capacity for attacking successfully new material of a kind similar to the old.

The results show a constant, though relatively slight, advantage for the inductive method in all tests involving the capacity to define novel groups of analogous figures. In the immediate and the deferred reproduction tests, which showed high positive correlations, the results were not so uniform. In the case of two groups of older pupils the inductive method was the more successful, being followed by more complete recalls; while the deductive method was the more successful in three groups, two of younger, and one of older pupils. The last-mentioned group, however, contained large sub-groups of inferior pupils, among whom those who had been inductively taught were able to give more complete reproductions. Winch's pedagogical conclusions are, that the method of teaching which enables pupils to deal most successfully with new material analogous to that which they have learned should receive serious consideration; and that examinations, if they are to test good method in teaching, should always include questions on subject matter analogous to, but not identical with, that which is set down in the syllabus of instruction.

Winch's method is ingenious, and his work is extremely suggestive. From a purely psychological viewpoint, however, his analysis of the factors of induction and deduction is not sufficiently thoroughgoing. His manner of dividing his subjects is open to criticism on the ground that the method employed in his preliminary tests is practically identical with one of the methods of teaching which the

experiment aims to evaluate, *i. e.*, his inductive method; and consequently in the division of the pupils, capacity for inductive defining is favored. This objection becomes more serious in view of the fact that his tables show relatively slight and sometimes insignificant differences between the results of his two methods. But the book should serve as a stimulus to every student who is interested in the experimental solution of disputed questions in educational science.

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Philosophie des Möglichen. Grundzüge einer Erkenntniskritik. VON DR. JOHANNES MARIA VERWEYEN. Leipzig, Verlag von S. Hirzel, 1913. Pp. vii, 240.

The nature of possibility is discussed by the author in various connections, such as contingency with reference to the existence or non-existence of the universe as a whole, contingency in volitional conduct, and contingency in relation to physics, to historical method and to theology. With regard to contingency in general, he concludes that the most fundamental riddle is that of being *uberhaupt*. We are unable to grasp being in such a way that it is seen to include necessary existence. Contingency with reference to events within the existent universe is reduced to abstract or hypothetical modes of conception. As a consequence, indeterminism is ruled out of court, and it is shown that when disputes arise concerning the freedom of the will, the determinist argues from the standpoint of the really existent, whereas the indeterminist pleads for abstract variability, which means that with a different volition a different course of conduct will ensue. The question of conceivability is first distinguished from imaginability and is then decided by reference to a mind that possesses certain *a priori* potencies of thought, which is proved by the procedure of mathematics. It is conceded that the occurrence of miracles in the past can not be denied categorically, i. e., that a certain contingency of this kind in human affairs can not be proved to be impossible, but simply that the entire weight of historical evidence is against this supposition.

At various points in the presentation the reader has proper occasion to regret that the analysis is not pushed a step further. What, for example, is the nature of this stupendous riddle concerning being *an sich* or in the abstract? It is pertinent to inquire as to the conditions of any event within the universe, but when this inquiry is extended to the universe as a whole, are we becoming profound or merely foolish? If the wonder why something rather than nothing exists does not carry with it a reference to controlling conditions, what is its precise import? And similarly in the matter of miracles, if we do not assume an agency which does something, thus presupposing time, and which is yet non-temporal, what is the real point of the discussion? Problems of this kind solve themselves if we only succeed in giving a reasonably definite formulation of the point at issue. The nature of contingency is not to be decided by an appeal to abstract *Denkmöglichkeit*, but by a study of intelligence as a function in organic behavior. If we interpret intelligence in this way, many of our problems and their solutions become purely verbal. Moreover, the perennial question of the freedom of the will is then seen to be based on an assumption that is common to both parties to the dispute. An acceptable solution of the puzzle becomes impossible, since we are compelled to choose between a hypostatization of